

FRICTIONAL JOINT FOR TOYS

Cross-Reference to Related Applications

[0001] This application claims priority under 35 U.S.C. 119(e) to U.S. Provisional Patent Application No. 60/426,021 entitled "Frictional Ball-And-Socket Waist Joint," filed November 12, 2002, the disclosure of which is incorporated herein by reference.

Background

[0002] The present disclosure relates generally to movable toys, and more specifically, to joints of action figures and dolls. Movable action figures and dolls (e.g., action figures having shoulder/elbow joints, hip/knee joints, waist joints, etc.) can provide imaginative fun for children. Movable joint motion allows a child to configure a toy as he or she chooses. Examples of such toys are disclosed in U.S. Patent Nos. 3,277,602; 3,628,282; 3,988,855; 4,274,224; 4,968,282; 5,989,658; and 6,435,938, the disclosures of which are incorporated herein by reference. Typically, it is desirable that the joints and other structures which enable relative movement be durable, enable the desired range of movement, and be relatively inexpensive to manufacture.

Summary

[0003] The present disclosure is directed to a movable toy, such as a doll or action figure, having a joint or like mechanism that enables relative movement. In some embodiments, the toy includes two or more body part members interconnected by a joint having a plug and a socket for receiving the plug. The socket includes one or more protrusions, against which the plug is urged to create friction between the plug and socket, thereby restricting joint motion.

Brief Description of the Drawings

[0004] Fig. 1 depicts an embodiment of a movable toy according to the present description.

[0005] Fig. 2 is a cross-sectional exploded view of the movable toy of Fig. 1,
5 showing components of the toy that are movably interconnected by a joint according to
the present description.

[0006] Fig. 3 is a detailed exploded view of the joint shown in Fig. 2.

[0007] Fig. 4 is a cross-sectional view of the components of Fig. 2 assembled.

[0008] Fig. 5 is a cross-sectional view similar to Fig. 4, but showing an alternate
10 embodiment of a joint according to the present description.

Detailed Description

[0009] Fig. 1 depicts a toy 10 according to the present description. In the depicted example, toy 10 is implemented as an action figure having several body part members 12 with movable interconnections between the members. These movable interconnections
15 take the form of joints 14 defined between body part members 12. The joints enable the various body part members to be moved relative to one another in various ways.

[0010] Typically, a given joint is configured to enable one part of the toy (e.g., a body part member) to be moved relative to another, and then maintain the relative position of the parts once a desired position has been achieved. For example, toy 10 has
20 a first body part member, such as torso 16, and a second body part member, such as pelvis 18. One of joints 14 forms a waist joint 20, defined between torso 16 and pelvis 18 to enable relative motion between the torso and pelvis. The remaining description will

focus primarily on the waist joint, though it should be appreciated that the structures and mechanisms to be discussed may be implemented in other locations on a doll, and in movable toys other than dolls.

[0011] As shown in Figs. 2-5, joint 20 may include a plug portion or assembly 22, 5 and a socket portion or assembly 24 that receives plug 22. Plug portion 22 is formed on one of the first and second body part members, such as on pelvis 18, while socket portion 24 is formed on the other of the first and second body part members, such as on torso 16. Socket portion 24 includes a friction assembly 26 that inhibits relative movement between plug portion 22 and socket portion 24. Friction is produced between multiple 10 socket contact regions 28 and plug contact regions 30, also referred to as the operative surface of plug portion 22. In the depicted examples, contact regions are formed on a spherical head of plug portion 22, though it should be appreciated that other shapes and configurations may be employed.

[0012] In some embodiments, socket portion 24 has a support surface or wall portion 15 32 with several protrusions 34 extending therefrom that form socket contact regions 28. Joint 14 may be adapted so that plug portion 22 is urged into contact with protrusions 34 so as to create friction therebetween. The body part members are therefore able to maintain their relative positions during play.

[0013] As previously mentioned, joint 14 is comprised of socket portion 24 and plug 20 portion 22. These portions engage with one another to control relative movement between torso 16 and pelvis 18 (e.g., by inhibiting relative movement through friction), or other appropriate body part members 12. Plug contact region 30 articulates within

socket portion 24. In some embodiments, plug contact region 30 is spherical and mates with a cylindrically shaped socket portion, as shown in Figs. 2-4. Alternatively, only part of plug portion 22 may be convex and used as a contact region.

[0014] In some embodiments, such as shown in Figs. 2-4, socket portion 24 includes a socket insert 36. This insert may be useful in retaining plug portion 22 captured and held within socket portion 24 and increasing the frictional surface contact between socket portion 24 and plug portion 22. In other embodiments, as shown in Fig. 5, socket insert 36 is replaced by additional protrusions 34, or extension of the existing lateral protrusions, thus reducing the number of overall components needed to assemble toy 10.

[0015] In the depicted examples, insert 36 has an opening sized to accommodate passage of a shaft 58 that extends away from head 30 of plug portion 22. Typically, the opening is smaller than the diameter of head 30, so as to maintain the head captured and held within socket portion 24. Also, the area around the opening typically is adapted to contact the head of plug portion 24 and urge it toward the frictional contact surfaces of the socket.

[0016] Socket portion 24 typically includes one or more protrusions 34 extending inward toward the head of plug portion 22. The protrusions may be formed on the torso of the doll, as indicated in the figure, or may be manufactured as a separate piece to be inserted during assembly. Protrusions 34 typically are adapted to provide the friction described above, so as to inhibit movement (e.g., rotation) of plug portion 22 within socket portion 24, thereby inhibiting relative movement of the respective members of the toy (e.g., body part members 12). As shown in Figs. 2-5, protrusions 34 may take the

form of ribs having contact regions 28 configured to correspond to plug contact region 30. The protrusions shown in Figs. 2-4 have ends that are angled opposite one another to form a V-shaped seat that straddles and receives the head of plug portion 22. Alternatively, or additionally, contact regions 28 may be concave to provide increased 5 contact with at least a portion of the convex contact region of plug portion 22, as shown in Fig. 5.

[0017] The protrusions themselves may also be aligned towards one another so that the protrusions approach operative surface 30 from different directions, or they may extend parallel to one another from the socket wall. Furthermore, the ends of the 10 protrusions may be angled or formed with a concave contour to complement the concave operative surface of the head of plug portion 22. In addition, the head of the plug portion may be provided with grooves for receiving the protrusions, so as to provide desired constraints on the relative movement permitted between the parts of the toy.

[0018] As shown in Fig. 2, torso 16 may be subdivided into a torso front 38 and a 15 torso back 40 that define an internal compartment 42. Internal compartment 42 may provide space for the joint components, so as to conceal the joint components and/or protect the components. Accordingly, in the depicted example, torso 16 is configured to conceal at least plug portion 22 and protrusions 34. The section of torso 16 nearest pelvis 18 forms a tapered base, or pelvis mating region 44, which allows a lower end of torso 16 20 to be recessed within pelvis 18, as shown in Figs. 4 and 5.

[0019] Socket portion 24 may have additional structure to secure socket insert 36 within its respective body part member 12. As shown in Figs. 3 and 4, socket insert 36

has a flange 46 that anchors socket insert 36 to torso 16 within internal torso compartment 42. As indicated, flange 46 may rest between plates 48 located in pelvis mating region 44 of torso 16 and may thereby be restricted from translating out of alignment once torso front 38 and torso back 40 are joined together.

5 [0020] Similar to torso 16, pelvis 18 may be formed from a pelvis front 50 and a pelvis back 52 that form an internal pelvis compartment 54, as shown in Fig. 2. Pelvis 18 further includes a cupped surface 56, which receives pelvis mating region 44 of torso 16, thereby concealing portions of joint 20.

[0021] Plug portion 22 may be anchored to the body part member opposite that in 10 which socket portion 24 is mounted, such as to pelvis 18. As shown in Fig. 3, plug portion 22 may have a shaft 58 extending from a head 30 of the plug portion. At the end of shaft 58, opposite plug contact region 30, an anchor 60 may be provided to secure the plug portion to pelvis 18, via plug flange 62. Referring to Fig. 4, flange 62 secures plug portion 22 to pelvis 18 by engagement with a pelvis plate 64 located within pelvis 18. As 15 shown, shaft 58 has two flanges 62 that straddle a single pelvis plate 64. Alternatively, pelvis 18 may have a pair of plates, between which a single flange on shaft 58 rests.

[0022] In Fig. 4, at least some of plug portion 22 may extend through an aperture 66 of socket portion 24, such as via shaft 58. Torso plates 48 and pelvis plates 64 typically have notches or other openings to provide a channel through the plates, for passage of 20 shaft 58. This arrangement allows plug portion 22 to be mounted by one end in pelvis 18 and the other end to be received by torso 16 for engagement with socket portion 24, as depicted in Fig. 4.

[0023] Once the components of toy 10 have been aligned in their appropriate positions, as previously discussed, the front and back portions of torso 16 and pelvis 18 are joined together using any suitable method, such as those generally known in the art. In some embodiments one half of a body part member includes pins or posts 68, while 5 the other half of the body part member includes receptacles 70 that receive posts 68. In such a configuration, posts 68 are simply aligned with, and pressed into, receptacles 70 to snap the two halves together.

[0024] It is believed that the disclosure set forth above encompasses multiple distinct inventions with independent utility. While each of these inventions has been disclosed in 10 its preferred form, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense as numerous variations are possible. The subject matter of the inventions includes all novel and non-obvious combinations and subcombinations of the various elements, features, functions and/or properties disclosed herein. Similarly, where any claim recites "a" or "a first" element or the equivalent 15 thereof, such claim should be understood to include incorporation of one or more such elements, neither requiring nor excluding two or more such elements.

[0025] Inventions embodied in various combinations and subcombinations of features, functions, elements, and/or properties may be claimed through presentation of new claims in a related application. Such new claims, whether they are directed to a 20 different invention or directed to the same invention, whether different, broader, narrower or equal in scope to the original claims, are also regarded as included within the subject matter of the inventions of the present disclosure.